

PATENT SPECIFICATION



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PROVISIONAL SPECIFICATION.

Transmission Mechanism for Motor Land and Water Vehicles.

We, RICHARD STREADER, O.B.E., No. 3, New Road, Littlehampton, Sussex, British subject, and THOMAS O'HARA HORSMAN, 18, South Terrace, Littlehampton, Sussex, British subject, do hereby declare the nature of this invention to be as follows:—

This invention relates to all motor vehicles, private, commercial, farming and the like, also paddle steamers driven by mechanical power. In the case of paddle steamers, the paddle takes the place of the driving wheels of a land vehicle & the steering is accomplished in the same way as prevails in a land vehicle.

COMPONENT PARTS OF THE MACHINE.

1. Metal chassis—ordinary—or special type for agricultural use.
2. Engine, ordinary type.
3. Three or four wheels, two being driving wheels, with cogs fixed in the rim or chained wheels, the remainder pivotted on the castor principle.
4. Axles, solid fixed.
5. Countershaft geared to the driving wheels.
6. Four clutches of ordinary type, placed on the countershaft, one at each end.
7. Chain or cogged wheels, placed at the end of the countershaft, into which fit the clutches similarly placed.
8. Steering wheel, which operates by releasing one or other of the clutches driving the road wheels.
9. Single lever, placed beside the steering wheel, operating the clutch on cogged or chain wheels.
10. Brakes, hand and foot.
11. Accelerator, worked by lever on the steering wheel.
12. Petrol tank, placed as convenient.
13. Radiator, placed as convenient.

NATURE OF THE INVENTION.

A method by which power may be
[Price 1/-]

applied direct from the engine to the road wheels without the intervention of differential gear, or gear box in other words, of driving the machine without differential or gear box.

METHOD OF ATTAINING THIS RESULT.

The operating parts are:

- Engine.
- Countershaft.
- Four clutches.
- Cogged wheels or chains.
- Cogged driving or chain driven road wheels.

The engine is geared to the countershaft by a pair of cogged wheels and chains, ensuring backward and forward motion and the vehicle is driven by chain or cogged wheels fixed at the end of the countershaft and fitting exactly into the cogs of the driving wheels.

These movements are actuated by two clutches worked by a single lever, which operates the clutch fixed in either the cogged or chain wheels on the countershaft.

Each road wheel is driven from the countershaft by a clutch at its own end. The steering wheel operates these clutches by either cam or screw movement. A movement of the steering wheel to the right will put the righthand clutch out of action, the righthand wheel then ceases driving, while the lefthand wheel continues its driving. The effect of which is a turning movement from left to right, in other words, in order to turn to the right, the steering wheel is moved to the right & *vice versa*. In order to secure a sharper turn, brakes are put on the particular wheel desired by a further movement of the steering wheel.

Furthermore, the non-driving wheel or wheels being pivotted on the castor principle, permits of ready turning movement. The vehicle or machine can be

turned round in a space equal to its own length and double its width.

The advantages claimed are;

1. No differential gear.
2. No gear box.
3. Backward and forward motion.
4. Turning adaptability.
5. Greater efficiency and simplicity,

and longer life as the power is transmitted from the engine to the road wheels without the intervention of differential or gear box. 10

Dated this 11th day of June, 1923.

RICHARD STREADER, O.B.E.,
T. O'HARA HORSMAN. 15

COMPLETE SPECIFICATION.

Transmission Mechanism for Motor Land and Water Vehicles.

We, RICHARD STREADER, O.B.E., 3, New Road, Littlehampton, Sussex, Engineer, British, THOMAS O'HARA HORSMAN, 18, South Terrace, Littlehampton, Sussex, Barrister-at-law, British, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to transmission mechanism for motor vehicles, private, commercial, agricultural, and the like, also paddle steamers.

The chief object of the invention is the construction of a power unit with such before mentioned transmission mechanism, by means of the construction and combination of parts herein set forth.

According to the invention, we provide transmission mechanism for motor vehicles and paddle vessels, in which the engine shaft drives a parallel countershaft through forward and reversing gearing, the road wheels or paddle wheels being driven through steering clutches provided on the end of the countershaft. Other objects of the invention will hereinafter appear.

Referring to the accompanying illustrative drawings, which relate to the construction of such before mentioned vehicles,

Fig. 1. shows vehicle in side elevation.

Fig. 2 shows vehicle in plan.

Figs. 3 shows the operation of the two speeds employed as hereinafter described.

Fig. 4. shows centre section of the lower speed of the two speeds employed, as shown in Fig. 3.

Fig. 5. shows plan and two side elevations of the cams on the bottom of the steering column, the varying use of such column is hereinafter set forth in detail.

Fig. 6. shows the side elevation of the brakes, used either for turning vehicle, or turning, while, at the same time, checking vehicle, *e.g.* on a hill.

Fig. 7. shows centre section of clutches on countershaft, in cases where the two speed gear, is not provided. 65

Such vehicle, the construction of which is herein set forth, constitutes a separate unit, and, in conjunction with various instruments or implements, performs different operations, also various readily adapted conversions are effected with the aid of such unit. 70

Referring to Fig. 1, 1 indicates the chassis, square, rectangular, or otherwise, in shape, of varying size, constructed to provide one lug at each corner, to which anything required may be attached. To the chassis is attached a short V shaped frame, with a castor wheel, 33, at its apex, so that the vehicle can conveniently be run about, when unattached, such V shaped frame may be discarded, if desired, and a frame of convenient size, or shape, with one or more castor wheels, attached to the vehicle. A platform is fixed to the chassis, completely covering the same. To, and beneath, such platform, at a convenient spot, the oil and water tanks, also engine, are fixed. Such platform completely covers the various mechanical parts of the vehicle. 75

The road or driving wheels, 6, (with chain wheels or cog wheels 5, fixed on their inside) are connected by a substantial fixed axle 12. Steering is effected by such road wheels in a manner hereinafter described. The crankshaft, 2, runs through the engine and is supported by brackets and bearings on the chassis. A single chain wheel 21, Fig. 2, and a single cog wheel 3, are placed on the crankshaft 2, also clutches 4, 4^a. The countershaft, 22, is geared to the driving wheels in the following manner. Chain wheels or cog wheels, 23, Fig. 1 are placed at its ends, which engage the chain wheels or cog wheels 5, fixed on the driving wheels 6. Two clutches, 7, fit exactly into the chain or cog wheels placed at the end of the countershaft, and operate them, as will hereinafter 85 90 95 100 105 110

appear in the description of the steering. 7 also shows portions of cog wheel on countershaft, the opposite side of 7 appearing in Fig. 6. A single chain-wheel, 8 Fig. 2 and a single cog wheel 9, more if necessary, are placed approximately on the centre of the countershaft 22, engaging with the chain or cog wheels placed, as already indicated, on the crankshaft 2. Two clutches 10, 11 Fig. 2 engage the chain and cog wheels, near the centre of the countershaft, so that in the case of a cog driven machine, there will be three cog wheels on the countershaft, and one on the crankshaft, together with one chain wheel on each, similarly for chain drive 5. Figs. 1 & 2 indicate the cog ring fixed on the road wheels, into which the cog wheel 23 or chain wheel is geared. 12 shows centre of axle, 13 steering column and wheel. The steering wheel, placed conveniently on the platform, is connected to the two clutches 7, placed, as indicated, at the end of the countershaft and operates them by cam movement. Three pedals 14, 15, 16, Fig. 2, are placed near the steering wheel. 14 operates the two clutches on the centre of the countershaft, 15 operates the brake. 16 engages the two clutches 4, 4^a on the crankshaft 2, each pedal, 14 and 16 operating two clutches, engaging one and disengaging the other, or disengaging both, giving the forward and backward movement. One pedal 14 operates two clutches 10, 11, giving two speeds. The same pedal 14 in a different position of the plate, not shown, releases the clutch to a neutral position. With reference to the two speed gear, 17, Fig. 3, shows casting, all in one, of cog wheel, 9, chain wheel, 8, clutch into which cone 11 engages; also boss, revolving on countershaft 22. 11 shows cone sliding on the key 18 in the countershaft 22. 10 shows clutch sliding loosely on countershaft 22. 19 shows teeth in 10. 20 shows boss with a flange on same, fitted with rollers 24, end view being in Fig. 4. The working is as follows, the cone 11 sliding into clutch, comprised in casting 17, couples the chain wheel 21, or cog wheel, 3 to the countershaft 22, and the movement follows, in accordance with whether chain or cog wheel drive is employed, thus giving the top speed in either direction.

The second speed is obtained by sliding 10 over rollers 24. 24 is gripped closely by clutch 10 and cone forming part of casting 17 and the teeth 19 in clutch 10 are stopped by a suitable stop, fixed on chassis, so that when 10 engages 24, a sliding movement brings the stop 19 into action, and 10 is thus prevented

from revolving. The cone, in the casting 17, driven by the engine revolves rollers 24, which themselves revolve 20, which is keyed to countershaft 22—giving the second speed. The presence of the teeth 19 on clutch 10, renders 10 stationary, only when in use; when not in use, 10 revolves with the countershaft, and friction is avoided. Steering is effected in the following manner. Each driving wheel is driven from the countershaft by a clutch at its own end. A movement of the steering wheel to the right will put the right hand clutch out of action, see Fig. 2. The push rod 25 Fig. 2 being pushed to the right by the cam 26, the right hand wheel then ceases driving, while the left continues its drive, the effect being a turning movement from left to right, so that in order to turn to the right, the steering wheel is moved to the right, and *vice versa*. In order to secure a sharper turning movement, by a further turn of the steering wheel, brakes are applied by means of lever 26^c Fig. 5 on steering shaft 13, operating rods 27^a & 27 Figs. 2 & 6 to the particular driving wheel desired, which then ceases its drive. The brake is applied by means of a cam 28 which is rotated when a stop 29 on the rod 27 comes against the arm 28^a of the cam, the rod passing freely through this arm. The above description applies to level ground. When descending a hill, with all the brakes applied, by foot or hand, by means of the rod 30, rotation of the steering wheel will cause one rod 27 to act as a push rod and rotate the cam 31 so bringing the flat part of this cam into action and releasing the corresponding brake for turning the vehicle. When the desired turning has been effected, by simply releasing the steering wheel, the vehicle will immediately and automatically, find the position for straight running without any further handling of the steering wheel. Further brakes can be applied on cog wheel 5, similarly to the clutch brake.

Cam 26 Fig. 5 is used for ordinary steering purposes, and the steering column being raised, releases 26 and brings cam 26^a into operation, which puts both clutches out of action, so that the unit may be used for stationary work, while by turning the steering wheel, both clutches can be put into action for any desired work. By further raising steering column, cam 26^b can be put into action, putting both clutches out of action, and by turning the steering column, either clutch desired can be engaged. This is arranged for special purposes, conversion, and the like.

Cam 26^a on lower part 37 of steering column 13, operates rod 27.

Referring to Fig. 5, it may sometimes be of use to clear the platform of the vehicle completely, for some special object, with which the presence of the steering column will interfere. To effect this, the steering column is divided into two parts, by means of a socket joint, flush with the platform. The top of the lower portion 37 of the column is hollowed out for some three inches, into which the upper part of the column fits exactly, thus ensuring the simultaneous action of the column as a whole, when in ordinary use. The top of the lower half of the column is toothed to form a cog wheel. Beside this cog wheel, is another cog wheel of exactly similar dimensions, suitably mounted on chassis. The two cog wheels intermesh. The top part of the column will thus fit into either of the cog wheels. In order to steer, when the column is removed, a tiller is made to fit into either cog wheel desired, and steering proceeds by its means. The seat or seats 31 Fig. 1 fitting into sockets in the platform, are adjustable, a single seat being used, or two seats on either side of the steering wheel, if forward and backward movement is desired, in special circumstances.

36 Fig. 2 shows driving wheel on crankshaft for stationary work. Also wheels can be put on the countershaft 22 for driving other machines or for like purposes. It will be seen that the vehicle thus constructed, has neither back nor front, either end may be so regarded, it moves backward and forward with equal

facility, and by changing the upper portion of the steering column into either socket desired, right hand steering is effected in either movement.

In Fig. 1 31 shows driver's seat, 32 pins or perch bolts, used for attachment to other machines or for like purposes, 33 castor wheel, 34, forks of same.

When two speeds are not required, the countershaft 22 is simply provided with four clutches 7, 7, 8, 9, and the necessary spur and chain wheels as shewn in Fig. 7.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A power unit and transmission mechanism for motor vehicles and paddle vessels, in which the engine shaft drives a parallel countershaft through forward and reversing gearing, the road wheels or paddle wheels being driven through steering clutches provided on the ends of the countershaft.

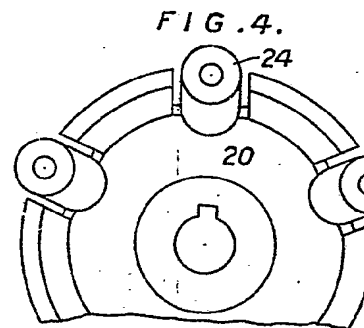
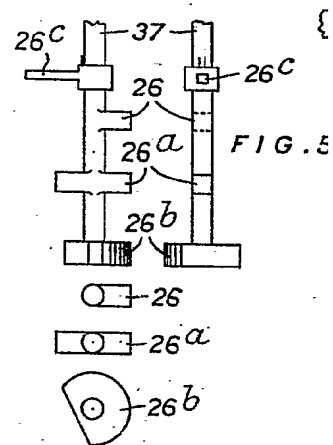
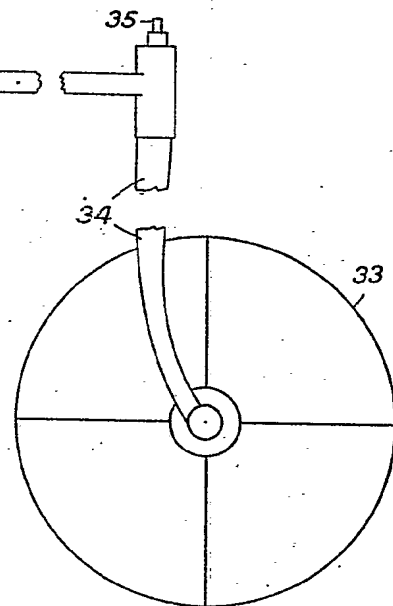
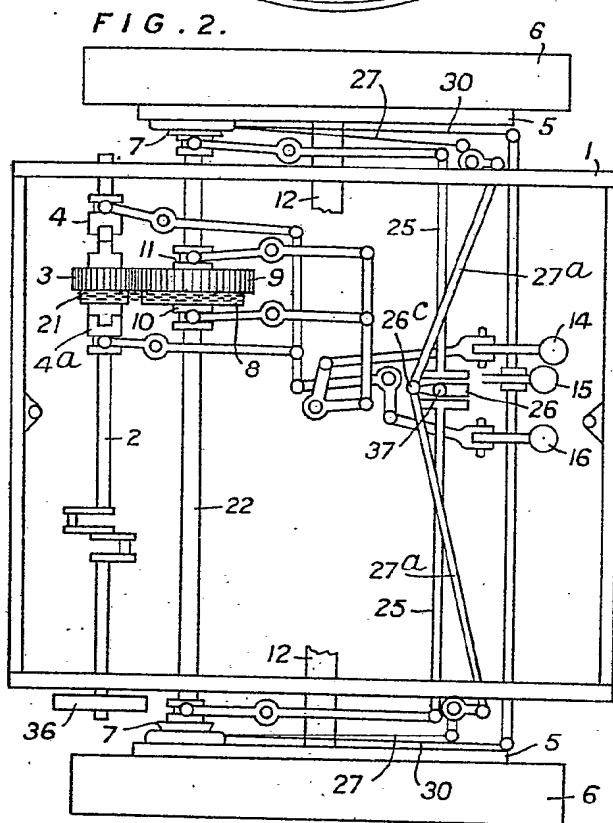
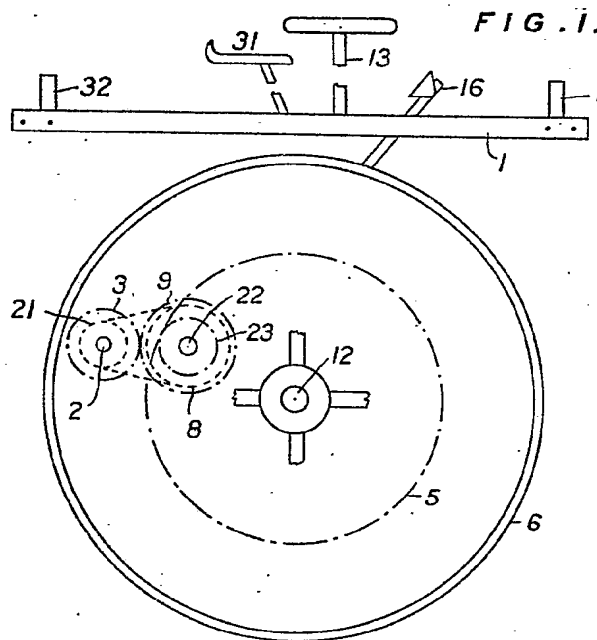
2. Transmission mechanism according to Claim 1 in which two speed epicyclic friction gearing is provided on the countershaft.

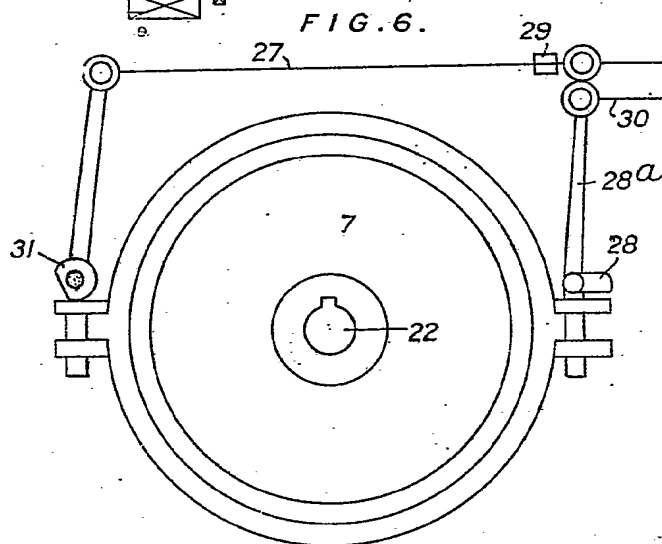
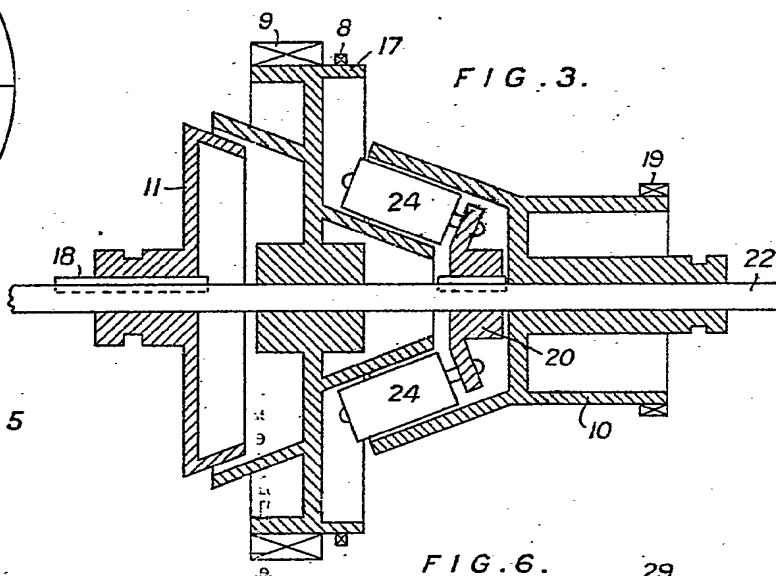
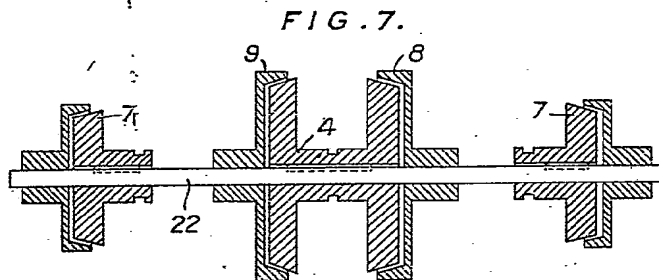
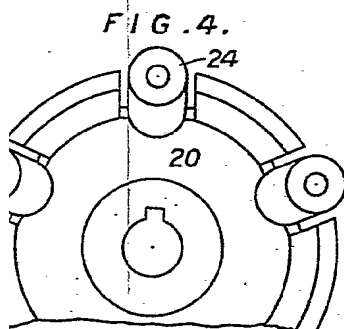
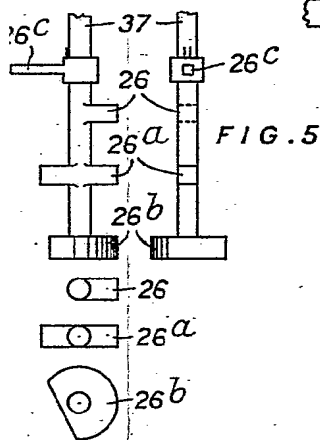
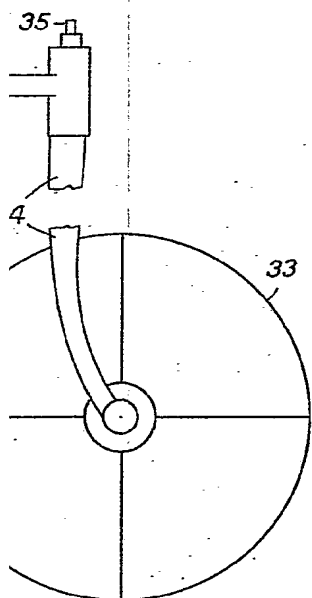
3. Transmission mechanism, according to Claim 1, in which brakes operated either separately or in conjunction with the steering clutches, or together for ordinary braking, are so arranged, that if the steering wheel is rotated when both brakes are applied, the brake on one side is released to effect the desired turning.

Dated the 14th day of May, 1924.

RICHARD STREADER, O.B.E.,
THOMAS O'HARA, HORSMAN.

[This Drawing is a reproduction of the Original on a reduced scale.]





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FIG. 1.

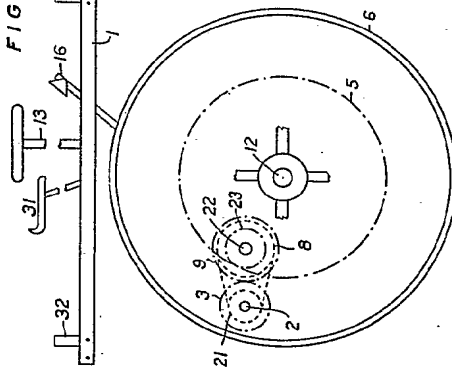


FIG. 2.

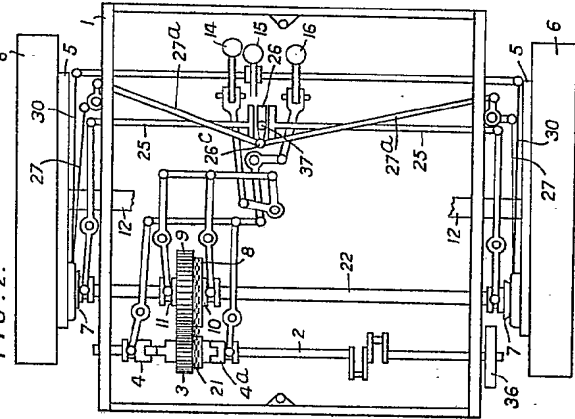


FIG. 3.

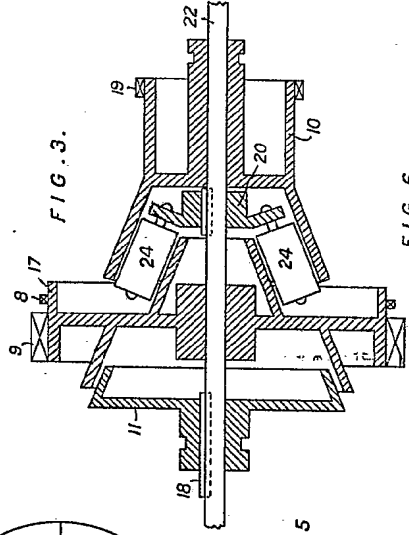


FIG. 4.

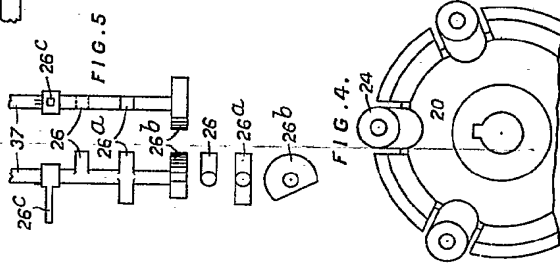


FIG. 5.

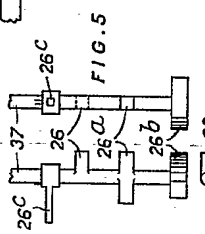


FIG. 6.

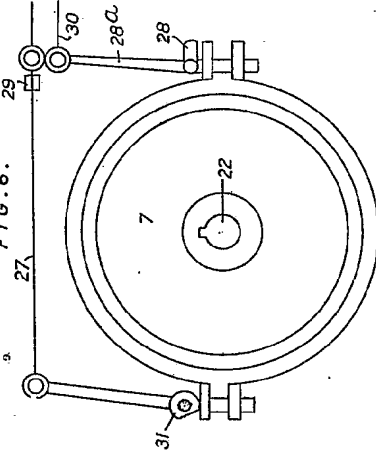


FIG. 7.

